

that the NKX2-5 mutants were associated with significantly decreased transcriptional activity compared with their wild-type counterpart.

Conclusions: The findings expand the spectrum of NKX2-5 mutations linked to AF and provide additional evidence that dysfunctional NKX2-5 may confer vulnerability to AF, suggesting the potential benefit for the early prophylaxis and personalized treatment of AF.

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Ox-LDL Triggers Cardiomyocyte Apoptosis and Heart Failure via Lectin-Like Oxidized Low-Density Lipoprotein Receptor-1

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Objectives: This study is designated to examine if and how ox-LDL triggers heart failure.

Methods: We investigated the role of ox-LDL and LOX-1 in heart failure. Bax, Bcl-2 were detected by Real-time RT-PCR. In addition, LOX-1 was detected by western blot analysis.

Results: Infusion of ox-LDL in mice for 4 weeks resulted in marked heart failure, as characterized by an increase in heart size, heart/body weight ratio, and plasma BNP levels, in conjunction with a lowered LV constriction function. Moreover, ox-LDL treatment promoted apoptosis and upregulation of LOX-1 protein in both cultured cardiomyocytes and murine hearts. Real-time RT-PCR findings revealed that ox-LDL treatment increased Bax/Bcl-2 ratio in cardiomyocytes. Moreover, inhibition of LOX-1 attenuated not only ox-LDL-induced cardiomyocyte apoptosis but also heart failure.

Conclusions: Our results indicate that ox-LDL triggers cardiomyocyte apoptosis and heart failure possibly through LOX-1 and apoptosis.

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Renal sympathetic denervation prevents left ventricular remodeling and improves cardiac function in a preclinical large animal model

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Objectives: This study investigated the effect of catheter-based renal sympathetic denervation (RDN) on left ventricular remodeling and cardiac function in a porcine model of heart failure induced by myocardial infarction.

Methods: Myocardial infarction was created by a percutaneous, permanent left anterior descending artery occlusion in Chinese Guizhou miniature swine (n=20). After myocardial infarction, 12 pigs underwent bilateral RDN and 8 pigs served as controls. Haemodynamic and echocardiographic data were measured at baseline and 8 weeks after myocardial infarction. Infarct size, histological changes and collagen volume fraction were evaluated after 8 weeks. Plasma norepinephrine, renin activity, angiotensin II and cardiac angiotensin II were also determined by radioimmunoassay.

Results: Compared with controls, RDN-treated pigs exhibited significantly greater LV ejection fraction (50.6±3.0% vs. 41.4±2.8%, P<0.01), systolic thickening fraction in the infarcted LV wall, and maximum LV dP/dt, as well as lower LV end-diastolic pressure. In addition, RDN reduced infarct size (7.7±0.9% vs. 12.9±2.1%, P<0.01) and prevented cardiac hypertrophy and fibrosis. What's more, Plasma norepinephrine concentration, renin activity, angiotensin II concentration and cardiac angiotensin II level were decreased in RDN-treated pigs (P<0.05).

Conclusions: In this preclinical model of heart failure, renal sympathetic denervation prevents left ventricular remodeling and improves cardiac function.

GW25-e1565

Tongxinluo reduces infarct size by promoting adhesion junction integrity in reperfused diabetic hearts via PPAR- α pathway

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Objectives: Structural and functional disruption of microvascular barrier caused by ischemia/reperfusion results in uncontrolled inflammation and ischemia/reperfusion injury (IRI). Hyperglycemia may aggravate myocardial IRI since it worsens the barrier function. Whether Tongxinluo (TXL) is involved in reperfused diabetic heart protection through protecting cardiac microvascular endothelial cells (CMECs) is unknown. In order to confirm the effect and mechanism of TXL-mediated cardiac protection, studies in vitro and in vivo were conducted.

Methods: HCMECs were cultured in normal (5.5mM) and high glucose (18mM) for 48 h respectively followed by glucose-oxygen-serum deprivation (GOSD) for 2 h and reoxygenation for 2 h. TXL (800 μ g/ml), PPAR- α inhibitor MK886 (1mM) were supplemented. Endothelial monolayer permeability was assessed. VE-cadherin internalization was detected by confocal microscope and western blotting. ICAM-1 expression was detected by western blotting. ZDF rats with Type 2 diabetes mellitus (T2DM) underwent 45 min ligation and 3 h reperfusion of LAD. Vascular permeability and infarct size were determined by FITC-dextran and TTC staining separately.

Results: Endothelial monolayer permeability was significantly increased after the GOSD/ reoxygenation treatment in a time and glucose concentration-dependent manner. Compared with the control group, TXL dramatically decreased the fluorescence intensity (1925±138 vs. 3558±133) and ICAM-1 expression, but remarkably increased the membrane/total VE-cadherin (35%±4 vs. 84%±6) in HCMECs. TXL significantly reduced fluorescence intensity (2914±388 vs. 4728±483) and infarct size (45%±6 vs. 52%±3) of ZDF rats with T2DM in AMI/reperfusion model compared with control group. These protective effects of TXL were partly inhibited by MK886.

Conclusions: Accordingly, TXL protects reperfused diabetic heart through attenuating VE-cadherin-mediated paracellular hyperpermeability via PPAR- α pathway.

GW25-e1594

Tongxinluo reduces infarct size by promoting endothelial adhesion junction integrity in reperfused diabetic hearts via PPAR- α pathway

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Conclusions: Accordingly, TXL protects reperfused diabetic heart through attenuating VE-cadherin-mediated paracellular hyperpermeability via PPAR- α pathway.

GW25-e1613

The First Coronary Angiography by Using the New Robot Operating System

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Objectives: Coronary angiography (CAG) and percutaneous coronary intervention (PCI) are widely used for coronary heart disease (CHD). However, these operations are performed in the cardiac catheterization laboratory with X-rays. Although the doctors can wear the heavy protective lead clothes to prevent X-ray radiation, they still cannot avoid completely the harmful radiation. What's more, some CAGs and PCIs are difficult because there are individual differences of coronary structure, which needs to be operated finely. The possible robot-assistant manipulation will be great useful in clinical practice. The study explored the feasibility and the validity of the new robot operating system for CAG.

Methods: Pigs were anesthetized and 6F sheath was inserted into the femoral artery. The 5F JR or JL catheter guide-wire was put manually into the sheath and the other end was connected artificially with the robot arm. The robot system was controlled outside of cardiac catheterization laboratory and the robot hand pushed the catheter into aortic sinus. The catheter was adjusted carefully to forth-back and rotation by manipulating the robot operating system. After the catheter was engaged well into the coronary ostium, the robot hand injected the contrast into the coronary.

Results: The new robot operating system had a good control function for CAG. The rotation angle can be fine-tuned to 0.1 degrees, and the forth-back length can be fine-tuned to 0.1 mm. The flow and the dose of contrast can be controlled accurately by using the robot injection system. By manipulating robot system outside of cardiac catheterization laboratory, we successfully completed the CAGs for 6 pigs without exposure to X-rays. The operation duration from putting the catheter manually into the sheath to finishing CAG was 8.2±1.2 min. All 6 pigs were survived after CAG.

Conclusions: The new robot operating system has the function of coronary catheter transmission and rotation. Doctors can avoid or reduce the X-ray radiation exposure during CAG by using this system. The robot operating system hopefully may become a clinical advanced medical device for CAG and even PCI.